WHAT IS CLAIMED IS:

1. A method for refining an approximate device location in a computer system comprising:

determining an approximate location of a device;

5 reading a rule base that comprises an ordered collection of rules;

capturing an imprecise input;

processing the imprecise input to determine a magnitude of participation of the input in the rules;

applying the rules to the imprecise input based on the magnitude of participation

10 to produce a logical product; and

computing a refined location based on the logical product.

2. The method of claim 1 further comprising:

gathering empirical data; and

15 progressively refining the rule base based on the empirical data.

3. The method of claim 1 wherein the rule base provides a default rule.

4. The method of claim 1 wherein the rule base is configured to reflect

20 regional trends, social trends, or demographic trends.

5. The method of claim 1 wherein one of the rules utilizes a logical product in an antecedent to determine a consequent.

6.   The method of claim 1 wherein the imprecise input is locational.

7.   The method of claim 1 wherein the imprecise input is activity profile

5   based.

8.   The method of claim 1 wherein the imprecise input is temporal.

9.   The method of claim 1 wherein the imprecise input is spatio-temporal.

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10.   The method of claim 1 wherein the magnitude of participation is within

an interval [0,1].

11.   The method of claim 1 wherein a three-valued set is defined for each

15   imprecise input, wherein the three-valued set comprises a truth value, a false value, and

an uncertainty value.

12.   The method of claim 1 wherein the logical product of each rule

comprises a value between 0 and 1.

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13.   The method of claim 1 wherein the refined location is computed by:

selecting the rule with the highest logical product; and

using a consequent corresponding to the selected logical product as the refined

location.

14.   The method of claim 1 wherein the refined location comprises a list of candidate locations.

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15.   An apparatus for refining an approximate device location in a computer system comprising:

(a)   a computer having a memory;

(b)   an application executing on the computer, wherein the application is

10   configured to determine an approximate location of a device;

(c)   an inference engine executing on the computer, wherein the inference engine is configured to:

(i)   read a rule base that comprises an ordered collection of rules;

(ii)   capture an imprecise input;

15   (iii)   process membership functions stored in the memory of the computer, wherein the membership functions define a magnitude of participation of the input in the rules;

(iv)   apply the rules to the imprecise input based on the magnitude of participation to produce a logical product; and

20   (v)   compute a refined location based on the logical product.

16.   The apparatus of claim 15 wherein the application is further configured to:

gather empirical data; and

progressively refine the rule base based on the empirical data.

17.   The apparatus of claim 15 wherein the rule base provides a default rule.

18.   The apparatus of claim 15 wherein the rule base is configured to reflect regional trends, social trends, or demographic trends.

19.   The apparatus of claim 15 wherein one of the rules utilizes a logical product in an antecedent to determine a consequent.

20.   The apparatus of claim 15 wherein the imprecise input is locational.

21.   The apparatus of claim 15 wherein the imprecise input is activity profile based.

22.   The apparatus of claim 15 wherein the imprecise input is temporal.

23.   The apparatus of claim 15 wherein the imprecise input is spatio-temporal.

24.   The apparatus of claim 15 wherein the magnitude of participation is within an interval [0,1].

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25. The apparatus of claim 15 wherein a membership function defines a three-valued set for each imprecise input, wherein the three-valued set comprises a truth value, a false value, and an uncertainty value.

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26. The apparatus of claim 15 wherein the logical product of each rule comprises a value between 0 and 1.

27. The apparatus of claim 15 wherein the inference engine is configured to

10 compute a refined location by:

selecting the rule with the highest logical product; and

using a consequent corresponding to the selected logical product as the refined

location.

15 28. The apparatus of claim 15 wherein the refined location comprises a list of

candidate locations.

29. An article of manufacture embodying logic that causes a computer-

implemented system to refine an approximate device location, wherein the logic

20 comprises:

determining an approximate location of a device;

reading a rule base that comprises an ordered collection of rules;

capturing an imprecise input;

processing the imprecise input to determine a magnitude of participation of the input in the rules;

applying the rules to the imprecise input based on the magnitude of participation to produce a logical product; and

5   computing a refined location based on the logical product.

30.   The article of manufacture of claim 29, wherein the logic further comprises:

gathering empirical data; and

10   progressively refining the rule base based on the empirical data.

31.   The article of manufacture of claim 29 wherein the rule base provides a default rule.

15   32.   The article of manufacture of claim 29 wherein the rule base is configured to reflect regional trends, social trends, or demographic trends.

33.   The article of manufacture of claim 29 wherein one of the rules utilizes a logical product in an antecedent to determine a consequent.

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34.   The article of manufacture of claim 29 wherein the imprecise input is locational.

35. The article of manufacture of claim 29 wherein the imprecise input is activity profile based.

36. The article of manufacture of claim 29 wherein the imprecise input is temporal.

37. The article of manufacture of claim 29 wherein the imprecise input is spatio-temporal.

38. The article of manufacture of claim 29 wherein the magnitude of participation is within an interval $[0,1]$.

39. The article of manufacture of claim 29 wherein the logic defines a three-valued set for each imprecise input, wherein the three-valued set comprises a truth value, a false value, and an uncertainty value.

40. The article of manufacture of claim 29 wherein the logical product of each rule comprises a value between 0 and 1.

41. The article of manufacture of claim 29 wherein the logic computes the refined location by:

selecting the rule with the highest logical product; and

using a consequent corresponding to the selected logical product as the refined

location.

42.   The article of manufacture of claim 29 wherein the refined location comprises a list of candidate locations.